Fact Sheet: Iodine-131

What is Iodine-131?

Iodine-131 (I-131) is a radioactive form of iodine. I-131 is a byproduct of nuclear energy production. It is also used in medicine to diagnose and treat disorders of the thyroid gland.

I-131 is a short-lived radioactive element, with a half-life of 8 days, meaning every 8 days it loses half of its radioactivity.

Pure I-131 is a non-metallic, purplish-black crystalline solid. However, because it readily binds with other elements, I-131 usually is found as a compound rather than in its pure form. For medical purposes, the I-131 capsules contain small granules of I-131 sodium iodide that are designed to be swallowed by patients. Liquid I-131 sodium iodide used to diagnose and treat thyroid disease is a clear liquid.

I-131 can be inhaled in the air or ingested in food and water.

How is the radioactivity of I-131 measured?

Radioactivity is measured in units called Curies. In small quantities, the radioactivity of I-131 is measured in picoCuries. A picoCurie is one-trillionth of a Curie, or 0.000000000001 of a curie. An even smaller unit of radioactivity is a femtoCurie, which is one thousand times smaller than a picoCurie.

What are the risks of I-131?

Exposure to large amounts of I-131 is dangerous to human health. External exposure to large amounts can cause burns, and internal exposure in significant quantities can cause cancer, particularly in the thyroid gland. Pregnant women and young infants are more susceptible to the adverse effects of I-131 ingestion.

Exposure to very small amounts of I-131 does not pose a meaningful risk to health.

What is known about I-131 in air, water, and food in Maryland?

Because radiation travels in the atmosphere, the Centers for Disease Control and Prevention and the Environmental Protection Agency have expected that very small amounts of I-131 would be detectable across the country using very sensitive equipment.

Air. Monitoring on the West Coast of the United States has identified very small amounts of I-131 in air samples, less than 1 picoCurie per cubic meter of air. Maryland sensors have detected even smaller amounts of I-131 in the air, measured in femtoCuries. The Centers for Disease Control and Prevention is reporting that other states are finding similar levels, none of which pose a risk to health.

Water. The Centers for Disease Control and Prevention has reported that elevated levels of I-131 have been identified in rainwater in Massachusetts and Pennsylvania, in the range of 40 to 100 picoCuries per liter. CDC has found that the levels in the rainwater in Pennsylvania and Massachusetts are "still about 25 times below the level that would be of concern for use as a sole source of water over a short period of time, even for infants and pregnant women, who are the most sensitive to radiation."

A rainwater sample in Maryland was reported on March 28, 2010, to have a level of I-131 (32 picoCuries per liter) consistent with the Pennsylvania and Massachusetts levels. Because rainwater is diluted by water in reservoirs and rivers or filters through the ground before reaching groundwater and is treated before reaching consumers in drinking water, we would not expect find levels of concern of I-131 in the public water systems. Initial tests of reservoirs used for drinking water at several locations in Maryland have found no detectable I-131. These tests can detect levels as low as 3.5 to 12 picocuries per liter. There is no public health concern for people using ground water from properly constructed private wells.

Milk and other food. As part of ongoing Federal safety requirements, there is regular testing of milk and other selected foods for radioactivity and other potential contaminants. The federal standard for I-131 in food is 4,600 picoCuries per kilogram of food product; for milk, this would be about 4,600 picoCuries per liter. In initial testing, Maryland has found no detectable I-131, using a test that can detect as low as 25 picoCuries per liter. The Department of Health and Mental Hygiene and the Department of Agriculture will continue to monitor milk and agricultural products.

Do levels of I-131 in Maryland represent a public health concern?

No. There is no public health concern for Maryland at this time.

Should I take Potassium Iodide?

No. The Department of Health and Mental Hygiene does not recommend that anyone take Potassium Iodide (KI). This is a protective drug for the thyroid gland to be used in case of radiation exposures far greater than any radiation exposure today in Maryland.

What additional monitoring is underway?

In coordination with federal agencies, Maryland is continuing to test water, precipitation, milk, and other food and environmental samples as appropriate until the situation in Japan and its consequences resolves. As the situation in Japan changes and our monitoring continues, the Department of Health and Mental Hygiene may make additional recommendations for the public.

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